

## Appendix 2. Survey of Managers on Phase 1 Studies

### Uncertainty—Sediment Dynamics

1. Sediment accretion in restored tidal areas are adequate to create and to support emergent tidal habitat ecosystems within the 50-year projected time frame.

**1a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	3	50%
No	0	0%
Somewhat	2	33.3%
No Opinion	1	16.7%

**1b. The usefulness of these studies for managers to make management decisions was:**

Excellent	1	16.7%
Very Good	2	33.3%
Good	2	33.3%
Poor	0	0%
Very Poor	0	0%
No Opinion	1	16.7%
Not enough information to form an opinion	0	0%

**1c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

The Callaway studies at A21 and A6 were very useful in understanding sediment dynamics. It was a lost opportunity not to have the funding to study sediment accretion in the E9 ponds after breaching. It would be important to extend sediment accumulation studies in Phase 2 to Eden Landing or the Ravenswood complex to see if the high sedimentation rates observed in Alviso also occur in areas where ponds are not as subsided, and where SSC may be different (ELER and Ravenswood). It is also important in Phase 2 to conduct a vegetation tracking study to assess changes from the baseline established by Fulfroost, et al.

Particularly interested in wet vs. dry year dynamics

Project should have included sediment monitoring in all complexes to help determine local sediment dynamics. Phase 2 tidal restoration projects should include funding for a sediment accretion/scour and local dynamics study. Alviso sediment/Hg work was useful for Alviso/Far South Bay/Dumbarton but work, and to a more limited extent, the SF2-Dumbarton shoals work was informative, but future work should also be done in Eden Landing complex.

**2. Sediment movement into restored tidal areas significantly reduce habitat area and/or ecological functioning (such as plankton, benthic, fish or bird diversity or abundance in the South Bay.**

**2a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	2	33.3%
No	0	0%
Somewhat	3	50%
No Opinion	1	16.7%
	0	0%

**2b. The usefulness of these studies for managers to make management decisions was:**

Excellent	0	0%
Very Good	0	0%
Good	3	50%
Poor	1	16.7%
Very Poor	0	0%
No Opinion	1	16.7%
Not enough information to form an opinion	1	16.7%

**2c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

It was a shame that funding could not be found to continue the mudflat studies at SF2 and A6 areas to assess how opening a pond to muted tidal and full tidal flows impacted the extent and quality of mudflat habitat. The studies are still useful to managers as they form a baseline to assess future studies. Priority in Phase 2 should be given to assessing the restoration impacts on the extent and quality of mudflat habitat, as it directly relates to the SBSP project being able to meet its goals to provide foraging habitat for shorebirds.

Project should have included monitoring in all complexes, though fish work in So. Bay was good for Alviso planning. Phase 2 tidal restoration projects should include funding for benthic/fish in tidal restoration areas and mudflat/subtidal study as appropriate and related. Interim use of restored ponds below marsh accretion elevations by waterbirds should be monitored, to support waterbird pond use goals and as related to Phase 2 planning for tidal restoration. Work/collaborate more directly with ISP and with Living Shorelines Project in Phase 2 planning.

The only reason I've given somewhat and good is not because of the quality of the work, but because it seems early in the restoration.

Not sure we captured the linkage between sediment movement and the stated ecological functions.

### 3. Restoration activities always result in a net decrease in flood hazard

#### 3a. Phase 1 studies had the appropriate scope of work to answer the management questions.

Yes	2	33.3%
No	1	16.7%
Somewhat	2	33.3%
No Opinion	1	16.7%

#### 3b. The usefulness of these studies for managers to make management decisions was:

Excellent	0	0%
Very Good	1	16.7%
Good	1	16.7%
Poor	0	0%
Very Poor	0	0%
No Opinion	1	16.7%
Not enough information to form an opinion	3	50%

#### 3c. Please elaborate on your responses above, or provide suggestions for Phase 2.

I'm not aware of any studies that specifically address this issue.

Some modeling done, but not enough.

While we don't have direct information that Restoration activities always result in a net decrease in flood hazard, we don't have info on the reverse- that restoration activities have resulted in any increase in flood risk. Alameda County Flood Control involvement and sharing or other technical coordination and could be modeled further or refined as needed.

### Uncertainty—Bird Use of Changing Habitats

#### 4. The habitat value and carrying capacity of South Bay for nesting and foraging migratory and resident birds be maintained or improved relative to current conditions.

#### 4a. Phase 1 studies had the appropriate scope of work to answer the management questions.

Yes	2	33.3%
No	0	0%
Somewhat	3	50%
No Opinion	1	16.7%

#### 4b. The usefulness of these studies for managers to make management decisions was:

Excellent	1	16.7%
Very Good	0	0%
Good	4	66.7%
Poor	0	0%
Very Poor	0	0%
No Opinion	1	16.7%
Not enough information to form an opinion	0	0%

**4c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

Again, while we have some data, it seems early in the restoration process before we could say we have addressed this question.

A good basis for future work and assessment of changes has been developed, and these studies need to continue into Phase 2 and future Phases. Especially if islands and other topographic features will be added to other ponds as part of Phase 2. As noted previously, it is important to continue the assessment of impacts on mudflat extent and quality, since that is the one area that funding cuts meant post-restoration studies could not be conducted.

While habitat value and carrying capacity of South Bay for nesting and foraging migratory and resident birds has yet to be fully described and analyzed using 10-year SBSP dataset, studies have provided info that is regularly used to compare with pond management and operations info such that it is a likely that on-going O&M would be sufficient to maintain or improve relative to current conditions.

For Phase 2, natural and human created habitats that are resistant to climate change should be emphasized.

**5. Shallowly flooded ponds or ponds constructed with islands or furrows provide breeding habitat to support sustainable densities of snowy plovers while providing foraging and roosting habitat for migratory shorebirds.**

**5a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	3	50%
No	0	0%
Somewhat	2	33.3%
No Opinion	1	16.7%

**5g. The usefulness of these studies for managers to make management decisions was:**

Excellent	1	16.7%
Very Good	2	33.3%
Good	2	33.3%
Poor	0	0%
Very Poor	0	0%
No Opinion	1	16.7%
Not enough information to form an opinion	0	0%

**5c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

Learned a lot, but still need more info to be confident in the carrying capacity of reconfigured ponds.

Wish the results were more favorable to date but again, it seems to me early to say whether or not SF2 will eventually be used by greater populations of shorebirds.

Existing monitoring and studies have supported the statement in #5, and info collected as a pond manager has helped to inform the monitoring and studies. Monitoring should be continued in Phase 2, such as E12-E13 and at SF2, A16 and other pond systems, such as E6A-E6B-E8. We should also be studying Avocet/Stilt/Tern breeding more comprehensively across complexes.

The Bird Synthesis study will be useful in further assessing foraging and roosting habitat for migratory shorebirds. Further study of plover enhancement techniques is needed. Also, what are the most cost effective predator management options (e.g. targeting a few gulls that seem to be targeting plovers for removal).

- 6. Ponds reconfigured and managed to provide target water and salinity levels significantly increase the prey base for, and pond use by waterfowl, shorebirds and phalaropes/grebes compared to existing ponds not managed in this manner.**

**6a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	2	33.3%
No	0	0%
Somewhat	2	33.3%
No Opinion	2	33.3%

**6b. The usefulness of these studies for managers to make management decisions was:**

Excellent	0	0%
Very Good	0	0%
Good	2	33.3%
Poor	1	16.7%
Very Poor	0	0%
No Opinion	1	16.7%
Not enough information to form an opinion	2	33.3%

**6c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

E12/13 study still in progress.

Existing dataset and studies have yet to provide baseline info that clearly shows what "optimum" or "target" water and salinity levels are most productive for each pond system. To this point, ongoing O&M has determined this "target" primarily in an ad-hoc manner, hind casting rather than forecasting. Refer to previous answer as relevant.

We have not yet gotten results from the studies at Pond E12/E13 to know how the results can be used by managers, but the scope of the study will hopefully provide excellent information for managers to enhance other ponds, especially for the salt-specialized species.

- 7. The creation of large isolated islands in reconfigured ponds maintain numbers (and reproductive success) of terns and other nesting birds in the South Bay, while increasing densities of foraging birds over the long term compared to ponds not managed in this manner.**

**7a. Phase 1 studies had the appropriate scope of work to answer the management questions:**

Yes	1	16.7%
No	0	0%
Somewhat	4	66.7%
No Opinion	1	16.7%

**7b. The usefulness of these studies for managers to make management decisions was:**

Excellent	1	16.7%
Very Poor	0	0%
No Opinion	0	0%
Not enough information to form an opinion	2	33.3%

**7c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

Need to finish Eden Landing studies before I can respond.

The "island recipe" is very useful for managers going forward. Islands are expensive to build, so it is helpful to know that a few islands in a pond is as good, maybe better than, several islands in a pond. This will help save costs. These studies are applicable to a managers at a wide range of habitats used by these nesting waterbirds (e.g. inland wetlands).

SF2 study, etc. did show that it is better to put a few number of islands in a large number of ponds, rather than many in one pond. Islands are useful, but dry pond bottoms, levees and berms continue to be used and are equally important.

**8. Pond and panne habitats in restoring tidal habitats provide habitat for significant numbers of foraging and roosting shorebirds and waterfowl over the long term.**

**8a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	1	16.7%
No	3	50%
Somewhat	1	16.7%
No Opinion	1	16.7%

**8b. The usefulness of these studies for managers to make management decisions.**

Excellent	0	0%
Very Good	1	16.7%
Good	1	16.7%
Poor	0	0%
Very Poor	0	0%
No Opinion	0	0%
Not enough information to form an opinion	4	66.7%

**8c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

Too soon in marsh development for this.

Panne habitat has not formed in newly restored areas (e.g. Pond A21). It is clear that the newly restored marshes provide transitional mudflat habitat - the real question is what will happen long term to shorebirds abundance as that transitional mudflat habitat becomes marsh. The extent of transitional mudflat habitat is much greater than what the expected extent of panne habitat would be in a fully restored marsh.

Restored ponds act as mudflat with muted tidal influence since below marsh plain elevations. This is important info and in future decades the ponds/pannes in vegetated marshes should be monitored along with mudflat pond bottoms, etc.

**9. Ridgway's rails (aka CA clapper rail) and/or other key tidal habitat species respond to variations in tidal marsh habitat quality and what are the habitat factors contributing to that response.**

**9a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	3	50%
No	0	0%
Somewhat	1	16.7%
No Opinion	2	33.3%

**9b. The usefulness of these studies for managers to make management decisions was:**

Excellent	2	33.3%
Very Good	0	0%
Good	1	16.7%
Poor	1	16.7%
Very Poor	0	0%
No Opinion	1	16.7%
Not enough information to form an opinion	1	16.7%

**9c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

We still don't understand what level of mercury in tidal marsh habitat is too much for the rail. In other words, is there a level of Hg in rail eggs (related to environmental exposure of Hg) that so negatively impacts reproduction that a marsh could act as a population sink? The studies done to date could be furthered to address that question by looking at Hg status of a range of existing marshes.

Restored ponds not yet sufficiently vegetated/evolved to provide much rail habitat. Study of existing marshes by ISP etc. is very useful and should be supported along with future rail monitoring in restored areas.

Telemetry work to track use of ecotones or ISP islands?

**Uncertainty—Effects on Non-Avian Species**

**10. Increased tidal habitats increase survival, growth and reproduction of native species, especially fish and harbor seals.**

**10a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	3	50%
No	0	0%
Somewhat	1	16.7%
No Opinion	2	33.3%

**10b. The usefulness of these studies for managers to make management decisions was:**

Excellent	2	33.3%
Very Good	0	16.7%
Good	1	0%
Poor	1	0%
Very Poor	0	0%
No Opinion	1	0%
Not enough information to form an opinion	1	50%

**10c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

Better addressed when more marsh is restored and functional/mature.

No assessment was done for harbor seals, but the fish studies found that a wide array of aquatic organisms benefit from tidal restoration. It is unclear whether understanding tidal habitats benefits to harbor seals are needed/necessary (does not seem there is a NMFS requirement). Assessing benefits on harbor seals could be costly and involved; it would seem limited funding would be better addressed when more marsh is restored and functional/mature.

**Uncertainty—Mercury**

**11. Tidal habitat restoration and associated channel scour increase MeHg levels in marsh and bay-associated sentinel species?**

**11a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	4	66.7%
No	0	0%
Somewhat	2	33.3%
No Opinion	0	0%

**11b. The usefulness of these studies for managers to make management decisions was:**

Excellent	2	33.3%
Very Good	2	33.3%
Good	2	33.3%
Poor	0	0%
Very Poor	0	0%
No Opinion	0	0%
Not enough information to form an opinion	0	0%

**11c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

Continued assessment of Pond A8 complex is needed. Phase 2 studies should also assess other newly breached habitats for mercury accumulation in biota -- for example looking at biota in Pond A21 and Pond A6 would be useful for understanding over time what may happen in the A9-A14 ponds if restored.

Alviso Hg studies were directed by Water Board to Alviso and were useful for estimating mobilization and showing less MeHg mobilized/bioaccumulated than previously estimated. Studies should continue in Phase 2 to confirm preliminary results from Alviso. Other complexes should also be studied (e.g. Eden Landing E8A-E9-E8X)



**11. Pond management increases MeHg levels in ponds and pond-associated sentinel species?**

**12a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	4	66.7%
No	0	0%
Somewhat	2	33.3%
No Opinion	0	0%

**12b. The usefulness of these studies for managers to make management decisions was:**

Excellent	1	16.7%
Very Good	3	50%
Good	2	33.3%
Poor	0	0%
Very Poor	0	0%
No Opinion	0	0%
Not enough information to form an opinion	0	0%

**12c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

These studies in Pond A8/Alviso area are important studies that have expanded the understanding of mercury methylation in bay habitats, and are useful to other restoration projects in the bay.

Alviso Hg studies in Alviso and were useful for estimating MeHg mobilized/bioaccumulated. Studies should continue in Phase 2 to confirm preliminary results from Alviso. Other complexes should also be studied (e.g. Eden Landing E8A-E9-E8X)

**Uncertainty—Water Quality**

**13. The effect of a) pond management, including increased pond flows and associated managed pond effects, and b) increased tidal prism from tidal habitat restoration on water quality, phytoplankton and fish diversity and abundance, and food web dynamics in South Bay.**

**13a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	0	0%
No	1	16.7%
Somewhat	3	50%
No Opinion	2	33.3%

**13b. The usefulness of these studies for managers to make management decisions was:**

Excellent	0	0%
Very Good	1	16.7%
Good	2	33.3%
Poor	1	16.7%
Very Poor	0	0%
No Opinion	1	16.7%
Not enough information to form an opinion	1	16.7%

**13c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

Fish and water quality for sure, but not for phytoplankton.

While interesting, the Thompson study did not address the managers most pressing problem of poor water quality in the ponds. Water quality monitoring just created a pile of data that was never analyzed because it was so costly to do so after data were already collected. Recent work by Hobbs and Shellenbarger are showing that it may be an interaction between nutrient output from wastewater treatment plants (in particular in the far south bay) combined with the shallow, warm nature of the ponds, that is creating low DO conditions. There also appears to be a complex interaction with tidal stage and the diurnal timing of the tidal stage and DO levels in ponds and newly restored marshes. It appears there is a delicate balance between Alviso area being an extremely productive area to tipping the balance to hypoxic conditions. It would benefit to having further study to understand what is happening, and whether there are any management actions that could be done (or if no management actions are possible).

Alviso Fish studies useful for Island Ponds and other areas. Phase 2 should include more study on pond mgmt. with respect to water quality, phytoplankton and fish diversity and abundance, and food web dynamics, in all complexes.

Not aware of data on these topics.

**Uncertainty— Invasive and Nuisance Species**

**14. If not adequately eradicated, invasive Spartina and hybrids significantly reduce aquatic species and shorebird uses.**

**14a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	0	0%
No	1	16.7%
Somewhat	3	50%
No Opinion	2	33.3%

**14b. The usefulness of these studies for managers to make management decisions was:**

Excellent	0	0%
Very Good	1	16.7%
Good	1	16.7%
Poor	0	0%
Very Poor	0	0%
No Opinion	3	50%
Not enough information to form an opinion	1	16.7%

**14c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

ISP in charge of this effort (not SBSP), and their work has been useful.

Need to better collaborate with ISP on control/eradication, but Spartina and hybrids are well controlled/eradicated by ISP rather than by SBSPP. Gull studies/hazing effort also good info for management of ponds, etc.

We have evidence that invasive Spartina likely benefited the rail. These questions on adverse impacts to resources are best answered by the Invasive Spartina Project, and not the SBSP directly.

**15. California gulls, ravens, and crows are adversely affecting (through predation and encroachment on nesting areas) nesting birds in managed ponds.**

**15a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	5	83.3%
No	0	0%
Somewhat	1	16.7%
No Opinion	0	0%

**15b. The usefulness of these studies for managers to make management decisions was:**

Excellent	3	50%
Very Good	1	16.7%
Good	2	33.3%
Poor	0	0%
Very Poor	0	0%
No Opinion	0	0%
Not enough information to form an opinion	0	0%

**15c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

Nesting birds are well known to be adversely affected by predation through on-going monitoring and predator mgmt. efforts; Phase 2 should help find additional funding to control predators and study (positive) affects of removal, etc.

It was useful to understand that breaching of Pond A6 did little for decreasing the number of gulls, but was successful in increasing the breeding success of waterbirds. These studies will help managers to determine the best locations (away from gull colonies) to enhance habitat for waterbird nesting.

Good data on gulls.

**Uncertainty—Public Access and Wildlife**

**16. An increase in boating access significantly affects birds, harbor seals or other target species on short or long timescales.**

**16a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	0	0%
No	3	50%
Somewhat	0	0%
No Opinion	3	50%

**16b. The usefulness of these studies for managers to make management decisions was:**

Excellent	0	0%
Very Good	0	0%
Good	0	0%
Poor	0	0%
Very Poor	1	16.7%
No Opinion	1	16.7%
Not enough information to form an opinion	4	66.7%

**16c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

No studies were done to assess boating access impacts on resources. In a way it seems outside the scope of the SBSP to assess this question as the water trail impacts overall would be better to take on this question.

Not aware of studies.

This is a long-term (5-yr?) study question, rather than a short term (1-2 year) study; therefore no BACI study was done at Eden Landing, as originally proposed, due to affect of other factors and short term nature of a BACI study. Phase 2 should develop and fund an appropriate study, if possible.

**Uncertainty—Public Access and Wildlife**

**17. Landside public access significantly affects birds or other target species on short or long timescales.**

**17a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	3	50%
No	0	0%
Somewhat	3	50%
No Opinion	0	0%

**17b. The usefulness of these studies for managers to make management decisions was:**

Excellent	1	16.7%
Very Good	2	33.3%
Good	3	50%
Poor	0	0%
Very Poor	0	0%
No Opinion	0	0%
Not enough information to form an opinion	0	0%

**17c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

See response to #16. Phase 1 studies on ducks and shorebirds as related to trail use was useful, and helped develop buffer distances for SNPL, etc. but a longer term study should be considered in Phase 2.

I think our studies answer this question better for the short timescale but less so for the long timescale.

The studies that were done, on assessing buffer distances from trails on ponds, were very helpful and precise in describing needed buffers. Consideration in Phase 2 should be given to understanding the impacts of trails on marsh species as it may be better to put trails near marshes instead of ponds.

**18. Public access features provide the recreation and access experiences visitors and the public want over short or long timescales.**

**18a. Phase 1 studies had the appropriate scope of work to answer the management questions.**

Yes	4	66.7%
No	0	0%
Somewhat	1	16.7%
No Opinion	1	16.7%

**18. The usefulness of these studies for managers to make management decisions was:**

Excellent	0	0%
Very Good	2	33.3%
Good	3	50%
Poor	0	0%
Very Poor	0	0%
No Opinion	1	16.7%
Not enough information to form an opinion	0	0%

**18c. Please elaborate on your responses above, or provide suggestions for Phase 2.**

Visitor use survey results were informative, but this sort of social science could be improved by more regular user surveys and stakeholder engagement. Another study could be done (a year or more) after new Eden Landing public access is open.

Some of the public survey data was a bit contradictory which makes it somewhat hard to interpret.

**19. Any Additional Comments**

I would encourage SBSP folks to keep in mind that it's still early in the process and not interpret any results as the answer.